Drug Therapy Protocols: Oxygen

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<table>
<thead>
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<th>Date</th>
<th>April, 2016</th>
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<tr>
<td>Purpose</td>
<td>To ensure a consistent procedural approach to Oxygen administration.</td>
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<td>Scope</td>
<td>Applies to all QAS clinical staff.</td>
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<tr>
<td>Author</td>
<td>Clinical Quality &amp; Patient Safety Unit, QAS</td>
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**Oxygen**

**Drug class**
Gas

**Pharmacology**
A colourless, odourless gas essential for the production of cellular energy.

**Metabolism**
N/A.

**Indications**
- A wide range of conditions resulting in, or potentially resulting in systemic and/or localised hypoxia or hypoxaemia as listed in tables 1–4 of this DTP.

**Contraindications**
- Known paraquat poisoning with SpO₂ ≥ 88
- History of bleomycin therapy with SpO₂ ≥ 88

**Precautions**
- Patients with paraquat poisoning or bleomycin lung injury may be harmed by supplemental oxygen. Avoid oxygen unless the patient is hypoxaemic – target SpO₂ 88–92%
- Prolonged administration to premature neonates

**Side effects**
- Hypoventilation in some COPD patients with hypoxic drive.
- Drying of airway mucous membranes
## Presentation
- Size C Cylinder, 450 L *medical oxygen*
- Size D Cylinder, 1600 L *medical oxygen*

## Onset | Duration | Half-life
--- | --- | ---
Immediate | N/A | N/A

## Special notes \[1–5\]
- The administration of oxygen to correct hypoxaemia is evidence based. Severe hypoxaemia is harmful.\[1\]
- Diving accidents are **NOT** covered by this DTP – officers are to administer high flow oxygen.
- QAS oxygen saturation monitors are unable to differentiate between carboxyhaemoglobin and oxyhaemoglobin, therefore patients with carbon monoxide poisoning are to be administered the maximum oxygen dose irrespective of SpO\(_2\) readings.
- If a patient with COPD sustains or develops a critical illness/injury, the target saturation for the patient’s critical illness takes priority (see Table 1)
- For patients with COPD, nebulised salbutamol is to be delivered via nebuliser mask at a rate of 6 L/minute. For all other patients 8 L/minute is appropriate for nebulising drugs.

## Schedule
- Unscheduled.

## Routes of administration
### Inhalation (INH)
- Nasal cannulae (NC)
- Nebuliser mask (NEB)
- Simple face mask (SFM)
- Non-rebreather reservoir mask (NRBM)
- Bag-valve mask (BVM)
- Laryngeal mask airway (LMA)
- Endotracheal tube (ETT)
### Critical illness requiring HIGH levels of supplemental oxygen

**SpO2 < 85%:** 15 L/minute (NRBM)
- Administer until a reliable SpO2 measurement is available then adjust flow to aim for a target SpO2 of 94–98%.

**SpO2 ≥ 85 – 93%:** 2–4 L/minute (NC) OR 5–10 L/minute (SFM)
- Administer until a reliable SpO2 measurement is available then adjust flow to aim for a target SpO2 of 94–98%.

**INH**

### Conditions requiring CONTROLLED or LOW DOSE oxygen therapy

**SpO2 < 85%:** 15 L/minute (NRBM)
- Administer until a reliable SpO2 measurement is available then adjust flow to aim for a target SpO2 of 94–98%.

**SpO2 ≥ 85 – 93%:** 2–4 L/minute (NC) OR 5–10 L/minute (SFM)
- Administer until a reliable SpO2 measurement is available then adjust flow to aim for a target SpO2 of 94–98%.

**INH**
**Paediatric dosages**

**Significant illness AND/OR injury**

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<th>FR</th>
<th>PTO</th>
<th>ACM</th>
<th>ACP2</th>
<th>CCP</th>
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<td>INH</td>
<td>15 L/minute (BVM/NRBM) – BVM is only to be used if the patient requires positive pressure ventilation.</td>
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**Table 1 – Critical illnesses in adults requiring HIGH levels of supplemental oxygen**

- Cardiac arrest OR resuscitation
- Shock
- Sepsis
- Major trauma
- Trauma in pregnancy
- Near-drowning
- Anaphylaxis
- Major pulmonary haemorrhage
- Major head injury
- Carbon monoxide poisoning
- Active seizure
- Hyperkalaemia

**Table 2 – Serious illness in adults requiring MODERATE levels of supplemental oxygen**

- Acute hypoxaemia (cause unknown)
- Acute asthma
- Pneumonia
- Lung cancer
- Post-operative breathlessness
- Acute heart failure
- Pulmonary embolism
- Pleural effusion/s
- Deterioration of lung fibrosis or other interstitial lung disease
- Severe anaemia
- Pneumothorax
- Sickle cell crisis

**Table 3 – COPD and other conditions in adults requiring CONTROLLED or low dose supplemental oxygen**

- COPD
- Exacerbation of cystic fibrosis
- Chronic neuromuscular disorders
- Chest wall disorders
- Morbid obesity

**Table 4 – Conditions in adults NOT requiring supplemental oxygen unless the patient is hypoxaemic**

- AMI/ACS
- Pregnancy and obstetric emergencies
- Stroke
- Headache
- Post convulsion
- Abdominal pain
- Hyperventilation or dysfunctional breathing
- Most poisonings and drug overdoses (excluding carbon monoxide poisoning – refer to Table 1)
- Poisoning with paraquat OR bleomycin use
- Metabolic and renal disorders
- Acute or subacute neurological and muscular conditions producing muscle weakness
- Glycaemic emergencies
- Heat exhaustion/stroke
- Cardiac rhythm disturbances
- Non-traumatic chest pain
- ICD firing
- GI haemorrhage
ADULT OXYGEN ADMINISTRATION ALGORITHM

**Known or suspected carbon monoxide poisoning?**

- **N**

**Known or suspected paraquat poisoning?**

- **N**

**Critical illness requiring **HIGH** levels of O2?**

- **Y**
  - **SpO₂ ≥ 88%**
  - **SpO₂ > 93% AND VSS normal**

**Serious illness requiring **MODERATE** levels of O2?**

- **Y**
  - **SpO₂ > 93%**

**Conditions requiring **CONTROLLED** or **LOW DOSE** levels of O2?**

- **Y**
  - **SpO₂ ≥ 88%**

**Other conditions NOT requiring O₂ unless hypoxaemic**

- **Y**
  - **SpO₂ > 93%**

**15 L/min (BVM/NRBM)**

- **Monitor SpO₂. If saturations fall below 88%, administer the minimum amount of O₂ to maintain a target SpO₂ 88–92%.**

- **SpO₂ is < 85% administer 15 L/min (NRBM). SpO₂ 85–87% administer 2–6 L/min (NC) OR 5–10 L/min (SFM) – target SpO₂ 88–92%.**

- **Monitor SpO₂. If saturations fall below 94%, administer O₂ to maintain a target SpO₂ > 93%.**

- **Administer the maximum O₂ dose (BVM/NRBM) until the vital signs are normal, then reduce O₂ and aim for a target SpO₂ > 93%.**

- **Monitor SpO₂. If saturations fall below 94%, administer O₂ to maintain a target SpO₂ > 93%.**

- **SpO₂ < 85% administer 10–15 L/min (NRBM). SpO₂ 85–93% administer 2–6 L/min (NC) OR 5–10 L/min (SFM) – target SpO₂ > 93%.**

- **Monitor SpO₂. If saturations fall below 93%, administer O₂ to maintain a target SpO₂ > 93%.**

- **If SpO₂ < 85%, administer 10–15 L/min (NRBM). If SpO₂ 85–93%, administer 2–4 L/min (NC) OR 5–10 L/min (SFM) – target SpO₂ > 93%.**